CLAIMS:

1. A fuel cell, comprising:

a membrane electrode assembly including an electrolyte membrane held between an anode electrode and a cathode electrode;

an anode side separator and a cathode side separator clamping the membrane electrode assembly;

an oxidant gas channel provided on the cathode side separator, the oxidant gas channel starting from an oxidant gas channel inlet and reaching an oxidant gas channel outlet, the oxidant gas channel having a U-shape comprising a first route, a turning portion, and a second returning route; and

a fuel gas channel provided on the anode side separator, the fuel gas channel starting from a fuel gas channel inlet and reaching a fuel gas channel outlet, the fuel gas channel having a U-shape comprising a first route, a turning portion, and a second returning route, wherein

the oxidant gas inlet and the oxidant gas outlet are provided in one side of the cathode side separator, and the fuel gas inlet and the fuel gas outlet are provided in the other side of the anode side separator.

2. A fuel cell according to claim 1, wherein

a coolant inlet is provided at one of an upper side and lower side of the separators,

a coolant outlet is provided at the other of the upper side and lower side of the separators.

3. A fuel cell according to claim 1, wherein the separators are formed from metal thin plates.

4. A fuel cell according to claim 1, wherein the gas channels have boundary portions of the turning portions constituted by at least a part of said sealing member.

5. A fuel cell, comprising:

a membrane electrode assembly including an electrolyte membrane held between an anode electrode and a cathode electrode;

a pair of separator clamping the membrane electrode assembly; and

a plurality of gas channels provided on a gas channel surface of the separator, the gas channel surface facing the anode or cathode electrode, the gas channels starting from a gas channel inlet and reaching a gas channel outlet, wherein

the gas channels partially merge.

6. A fuel cell according to claim 5, wherein

each of the gas channels has a U-shape comprising a first route, a turning portion, and a second returning route, and

the second returning routes of the gas channels merge.

7. A fuel cell according to claim 5, wherein

the gas channel inlet and the gas channel outlet of the separator close to the anode electrode are provided in one side, and

the gas channel inlet and the gas channel outlet of the separator close to the cathode electrode are provided in the other side.

8. A fuel cell according to claim 6, wherein the turning portion acts as a buffer.

9. A fuel cell according to claim 5, wherein each gas channel comprises a plurality of sub-channels.

10. A fuel cell according to claim 6, wherein the cross-sectional area of the first routes is greater than the cross-sectional area of the second returning routes.

11. A fuel cell according to claim 5, wherein said pair of separators is formed from a metal thin plate.

12. A fuel cell according to claim 5, wherein said reactant gas channel has a turning portion, and a boundary portion of said turning portion is constituted by at least a part of said sealing member.

13. A fuel cell according to claim 5, wherein said gas channel has a turning portion, and a boundary portion of said turning portion is constituted by at least a part of said sealing member.

14. A gas channel plate for a fuel cell, comprising:

a plurality of gas channels provided on a gas channel surface of the separator, the gas channel surface facing the anode or cathode electrode, the gas channels starting from a gas channel inlet and reaching a gas channel outlet, wherein

the gas channels partially merge.

15. A fuel cell according to claim 14, wherein

each of the gas channels has a U-shape comprising a first route, a turning portion, and a second returning route, and

the second returning routes of the gas channels merge.

16. A fuel cell according to claim 14, wherein

the gas channel inlet and the gas channel outlet of the separator close to the anode electrode are provided in one side, and

the gas channel inlet and the gas channel outlet of the separator close to the cathode electrode are provided in the other side.

17. A fuel cell according to claim 15, wherein the turning portion acts as a buffer.

18. A fuel cell according to claim 14, wherein each gas channel comprises a plurality of sub-channels.

19. A fuel cell according to claim 15, wherein the cross-sectional area of the first routes is greater than the cross-sectional area of the second returning routes.

20. A fuel cell according to claim 14, wherein said pair of separators is formed from a metal thin plate.

21. A fuel cell according to claim 14, wherein said reactant gas channel has a turning portion, and a boundary portion of said turning portion is constituted by at least a

part of said sealing member.

22. A fuel cell according to claim 14, wherein said gas channel has a turning portion, and a boundary portion of said turning portion is constituted by at least a part of said sealing member.